IN THE CLAIMS

1. (Currently Amended) An n-dimensional broken mesh network comprising:

broken links which is generated by breaking connections between a starting switching element of each dimension and an ending switching element of each dimension;

input output protocol processing blocks connected to the broken links, wherein in input output protocol processing blocks convert an input/output link protocol to an internal link protocol; and

external traffic links connected to the input output protocol processing blocks,

wherein each switching element is identified by n-tuple coordinates, (d1, d2, ..., dn), and there are connections between two switching elements having n-1 same coordinates and the other coordinate is different only plus minus one, ±1, when the coordinates are numbered monotone increasing way by increment 1.

2. (Original) The n-dimensional broken mesh network of Claim 1, further comprising system control processors connected to the broken links.

3. (Original) The n-dimensional broken mesh network of Claim 2, further comprising jumping routes which increase a number of input and output terminals in the switching element, wherein the jumping routes provides a connection between a switching element and other element having n-1 same coordinates and the other coordinate is different only plus minus one, ±1, when the coordinates are numbered monotone increasing way by increment 1, wherein other element comprises a switching element, input output protocol processor, or system control processor.

4. (Original) The n-dimensional broken mesh network of Claim 2, wherein the system control processors are connected by a control system bus.

5. (Original) The n-dimensional broken mesh network of Claim 4, further comprising jumping routes which increase a number of input and output terminals in the switching element, wherein the jumping routes provides a connection between a switching element and other element having n-1 same coordinates and the other coordinate is different only plus minus one, ±1, when the coordinates are numbered monotone increasing way by

increment 1, wherein other element comprises a switching element, input output protocol processor, or system control processor.

6. (Original) The n-dimensional broken mesh network of any one of Claims 1, further comprising jumping routes which increase a number of input and output terminals in the switching element, wherein the jumping routes provides a connection between a switching element and other element having n-1 same coordinates and the other coordinate is different only plus minus one, ± 1, when the coordinates are numbered monotone increasing way by increment 1, wherein other element comprises a switching element, input output protocol processor, or system control processor.

7. (Original) The n-dimensional broken mesh network of Claim 6, wherein internal switching elements are removed and adjacent elements are connected, or surface switching elements are removed and the input output protocol processors are connected to the link which is connected to the removed surface switching elements.

8. (Original) The n-dimensional broken mesh network of Claim 7, wherein connection between two switching elements having n-1 same coordinates and the other coordinate is different only plus minus one, ± 1.

9. (Original) The n-dimensional broken mesh network of Claim 7, wherein the input output protocol processor is connected to at least one of the switching element through the broken link or jumping route.

10. (Original) The n-dimensional broken mesh network of Claim 7, wherein the system control processor is connected to at least one of the switching element through the broken link or jumping route.

11. (Original) The n-dimensional broken mesh network of Claim 8, wherein the input output protocol processor is connected to at least one of the switching element through the broken link or jumping route.

12.   (Original) The n-dimensional broken mesh network of Claim 8, wherein the system control processor is connected to at least one of the switching element through the broken link or jumping route.

13.   (Original) The n-dimensional broken mesh network of Claim 5, wherein each switching element comprises a switching controller, an input buffer with an input buffer monitor, an output buffer, wherein the switching controller processes a control packet when the control packet is entered into the input buffer.

14.   (Original) The n-dimensional broken mesh network of Claim 13, wherein each output buffer has an output buffer monitor, wherein when the output buffer is overloaded, the output buffer monitor reports to the switching controller to insert reporting data which is destined to the system control process into the output buffer or other output buffer.

15.   (Original) The n-dimensional broken mesh network of Claim 13, wherein the result of the processing the control packed by the switching controller is stored into arbitrary output buffer.

16.   (Original) The n-dimensional broken mesh network of Claim 13, wherein each switching element carries out dynamic self-routing.

17.   (Original) The n-dimensional broken mesh network of Claim 16, wherein if there is a packet to be delivered to a full output buffer, the packed is discarded when the packed is entered or the packed is in the front of the input buffer for routing.

18.   (Original) The n-dimensional broken mesh network of Claim 16, wherein the packet in the front line of the input buffer (FIFO) is discarded, if there is no available output buffer for the next packet destination with available packet buffer space.

19.   (Original) The n-dimensional broken mesh network of Claim 13, wherein the switching element stores the distance delta value of each jumping route to the switching element connected though the jumping route in the n-tuple delta values as $(\Delta 1, \Delta 2, ..., \Delta n)$,

in list form of (axis direction, delta value), or in the list form of delta value for the fixed axis's in the system.

20.   (Original) The n-dimensional broken mesh network of Claim 13, wherein the input protocol processor, system control processor, or the switching elements has the information of the jumping routes in the form of n-tuple delta value as $(\Delta 1, \Delta 2, ..., \Delta n)$, in list form of (axis direction, delta value), or in the list form of delta value for the fixed axis's in the system.

21.   (Original) The n-dimensional broken mesh network of Claim 8, wherein each switching element or a plurality of switching elements is mounted on a switching board, and the switching board is mounted on a unit cell through a socket, and wherein the unit cell is defined by n-tuple frames which are arranged in corresponding dimension, a wiring is formed along the frames to the socket.

22.   (Original) The n-dimensional broken mesh network of Claim 21, wherein coolant is flow inside the frame or the frame is in contact with a low temperature object.

23.   (Original) The n-dimensional broken mesh network of Claim 9, wherein each switching element or a plurality of switching elements is mounted on a switching board, and the switching board is mounted on a unit cell through a socket, and wherein the unit cell is defined by n-tuple frames which are arranged in corresponding dimension, a wiring is formed along the frames to the socket.

24.   (Original) The n-dimensional broken mesh network of Claim 10, wherein each switching element or a plurality of switching elements is mounted on a switching board, and the switching board is mounted on a unit cell through a socket, and wherein the unit cell is defined by n-tuple frames which are arranged in corresponding dimension, a wiring is formed along the frames to the socket.

25.   (Currently Amended) A switching system comprising:
n-dimensionally arranged frames;
n-dimensional unit cells defined by n-tuple frames of each dimension; and

switching boards mounted in unit cell, wherein a protocol processing block is connected to the switching boards mounted in unit cells located at outer surface or located interior remote from the outer surface are connected to a input output protocol processing block, and an outer traffic link is connected to the input output processing block, and wherein the protocol processing block converts an input/output link protocol to an internal link protocol.

26.   (Original) The switching system of Claim 25, wherein some of the unit cells does not have the switching board.

27.   (Original) The switching system of Clam 25, wherein each unit cells has a guide means on a surface or a corner of the frame for guiding an exchange apparatus for exchanging switching board.